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VNIT faculty develop efficient power storage, students make e-bike

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NAGPUR: Visvesvaraya National Institute of Technology (VNIT) faculty members and students have developed an eco-friendly bike and an e-capacitor, which have the potential to make urban transport system pollution-free.

The eco-bike 'VEB 1.0' (Visvesvaraya Electric Bike) has been developed by a team of 25 students from different engineering branches under the in-house Tesla Club of Innovation. The bike can touch a top speed of 47km per hour and run 66km on a single charge. The bike was designed and manufactured in three months at a cost of Rs62,000. The bike has inbuilt SMS alert system for emergencies, automatic headlights, can be started using a remote, and takes 3 to 4 hours to recharge.

Electrical department faculty member Ritesh Keshri, who was adviser of the team, said VEB 1.0 was an exclusively students' initiative. The team participated in national level 'Electric Bike Racing Challenge 2017' in Odisha, and stood second runners up, and won the 'future learning' award.

Keshri said the team will now work on reducing the weight through use of lithium-ion battery. Currently, the unladen weight is 140kg with the lead acid battery accounting for 63kg.

On the other hand, physics department head Babasaheb Sankapal and his PhD students Bidhan Pandit and Swapnil Kharade have developed a flexible and lightweight solid-state energy storage supercapacitor.

Sankapal claimed that the e-device, on mass production, can be used in place of batteries in electric buses and recharged at every halt within city limits. “The device can source energy from electrical points at bus stops, batteries or solar panels,” he said.

He explained that the device can be rolled up like films once used in cameras, and can be used for advanced technology and portable electronic devices.

The device was made using a combination of metal chalcogenide — a chemical compound — and carbon nanotubes to develop a hybrid. The hybrid material possess good conductivity, large surface area, good chemical stability, and good reversibility.

Sankapal said the innovation has been published in Nature Scientific reports. “The 1”x1” supercapacitor can light up an LED flash light and carries 1.8 volts energy. Right now, it can sustain for five minutes. The department of science and technology of Union government has allocated Rs60 lakh to develop the device further into a prototype,” he said.

Besides Sankapal, BB Kale of C-MET Pune, and industry partner R Sharma would be working on the prototype.

E-bike ‘VEB 1.0” Team

Kedar Padhye, Kalyani Parkhi, Monal Gedam, Abhijeet Gawande, Shantanu Domde, Abhijeet Kokas, Anurag Rautwar, Palash Dahake, Aditee Ramteke, Priya Kasote, Rugved, Talmale, Dikshanth Chahande, Kushal Patil, Aditya Kedia, Yash Devikdar,

Yogesh Phalak, Dexter Fernandes, Aravind, R Anirudh, Harshal Gabhne, Srushti Pikalmunde, Sahithi Maddipatla, Harshitha Reddy and Sneha Daskhne